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3rd Workshop of the CINC21 Coalition

Valcartier (Quebec, Canada), September 26th-28th, 2000

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Abstract

This document reports the minutes of the third (3rd) workshop of the CINC21 Coalition working group held at the Defence Research Establishment Valcartier, from September 26th to 28th 2000. The first day of the workshop was devoted to the Canadian projects that might be of interest for the collaboration. The second and third days were reserved for focus groups working sessions. The six focus groups were:

- Group 1: Visualisation Tools and Techniques
- Group 2: Distributed Collaborative Planning
- Group 3: Knowledge Management
- Group 4: Geospatial Information Systems
- Group 5: Common Ontology
- Group 6: Information Assurance

The workshop allowed the different groups to refine their action plans and contribute to the expected TTCP Project Arrangement. These action plans are reported in this document.

Résumé

Ce document est un compte rendu des travaux de l'atelier des pays alliés impliqués dans la collaboration Coalition CINC21. Cet atelier s'est déroulé au Centre de recherches pour la défense Valcartier (CRDV) du 26 au 28 septembre 2000. La première journée de l'atelier a été consacrée aux projets canadiens pouvant avoir éventuellement un intérêt pour la collaboration Coalition CINC21. Les deuxième et troisième journées ont été consacrées aux travaux des groupes d'intérêt. Ces groupes sont les suivants :

- Groupe 1: outils et techniques de visualisation
- Groupe 2: planification collaborative distribuée
- Groupe 3: gestion des connaissances
- Groupe 4: systèmes d'information géospatiale
- Groupe 5: ontologie commune
- Groupe 6: assurance de l'information

Cet atelier a permis aux différents groupes de raffiner leurs plans d'action pour contribuer à l'arrangement de projet TTCP PA. Ces plans d'action sont rapportés dans le cadre de ce document.

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Executive summary

Modern military operations have witnessed a tremendous increase in information processing requirements over the past twenty years. Effective information management is needed not only to communicate information and develop situational awareness of the battle, but also to anticipate opposition reactions, measure progress towards endstate, and keep all the components of the force on the right track towards conflict termination. By using the correct tools, commanders can deal with the right information at the right time to make dominating decisions and positively control operations.

Development of improved situation awareness or common operational picture (COP) capabilities remains a priority for our Allies, none of which currently has a COP capability that meets their requirements. Consequently there are several COP initiatives underway. Among those are the US Commander In Chief 21 Advanced Concept Technology Demonstrator (CINC 21 ACTD), the Common Operational Picture 21 Technology Demonstration (COP 21 TD), the UK Command Post 21 (CP 21) and the Australian TAKARI projects. A four-nation collaboration has been established to address key interoperability issues that will have an impact on technologies supporting Canada's future COP.

The four allied projects have similarity in exploring the operational and technical issues associated with building and using a COP. For example, they examine knowledge management techniques, improved visualization hardware and software technologies, collaborative planning capabilities, and interoperable architectures. As part of the CINC 21 collaboration, the four nations have defined a number of experiments dealing with the topics here above mentioned with the objective of providing interoperability across nations and shared situation awareness.

This memorandum presents the minutes of the 3rd CINC 21 Coalition workshop that was held at the Defence Research Establishment Valcartier, in September 2000, to define in more details the allied experiments to be held in July 2001 during the JWID exercise. During the workshop, a GroupWare tool, called Group System 5, was used successfully to enable more efficient definition of the experiments.

Guitouni, A, Gouin D, Woodliffe, E and Gauvin, M. 2000. 3rd Workshop of the CINC21 Coalition. [Enter report no.] DREV.

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Acknowledgements

The authors would like to thank all the nations members for their inputs and collaboration. They would also like to Mrs Ann Burns for her support to produce the material included in this document.

1. Workshop objectives and agenda

The third (3rd) workshop of the CINC 21 Coalition working group has been held at the Defence Research Establishment Valcartier, Quebec (Qc), Canada from the 26th to the 28th September 2000. The meeting objectives were in increasing order of importance:

1. To expose the Allied Nations collaborating on CINC21 to the CAN research and development projects that is most relevant CINC21 coalition experiments.

2. To review and articulate the actions plans of the six project groups in preparation of an interoperability demonstration in JWID '01.

3. To produce the material for the TTCP PA.

The workshop detailed agenda is presented hereafter:

Day 1: Tuesday, September 26th 2000

08:00 Hotel pick-up		
08:30 Coffee		
09:00 Welcome session	Chair: D. Gouin (CAN)	Auditorium II
Welcome speech	Dr G. Vézina (CAN)	
Guest Speakers	Cdr J. Barber (CAN)	
Opening remarks	LCol J.R. Barbour (US)	
Administrative directives	Mr D. Gouin (CAN)	
Review of the Workshop objectives	(All nations)	
Review of the Workshop Agenda	(All nations)	
10:30 Break		Auditorium II
11:00 Presentation of the TTCP-PA	Dr R. A. Rathmell (UK)	Auditorium II
11:15 Scenario Presentations		Auditorium II
Binni Scenario	Dr R. A. Rathmell (UK)	Auditorium II
CFC-Toronto Scenario: North Atlantis Scenario	Dr A. Guitouni (CAN)	Auditorium II
12:00 MaliCOTS: *Detection of Malicious Code in COTS Software & Electronic Visa and Fingerprint Recognition*	Mr R. Charpentier (CAN)	Auditorium II
12:30 Lunch		Cafeteria
13:30 Canada Round Tour Demos (20 min/demo)	Chair: Dr A. Guitouni (CAN)	
Commander's Advisory System for Airspace Protection (CASAP)	Mrs M. Bélanger and Dr A. Guitouni (CAN)	Auditorium I / A
Knowledge-based Adaptative Resource Management Agent (KARMA)	Mr J. Berger (CAN)	Auditorium I / B
Ontology for Search and Rescue (ONTOSAR)	Dr A.-C. Boury	Auditorium II
Electronic Task Support System (ETSS)	Mrs M. Gauvin (CAN)	

	Detection of Malicious Code in COTS Software (MaliCOTS)	Mr M. Salois (CAN)	DG Auditorium
15:15	Transport to DREV South		Building 200
15:30	Break		Building 200 (Cafeteria)
15:45	*Electronic Battle Box* (EBB)	Mr D. Gouin and Mr J.-C. St-Jacques (CAN)	Building 200 (3rd Floor)
16:15	*Topographic Map Display* (ToMaDi)	Mr R. Fortin (CAN)	Building 200 (3rd Floor)
	All Source Intelligence Producer with ToMaDi (ASIP)	Maj Gareau and Mr M. Lizotte (CAN)	Building 200 (3rd Floor)
	Joint Integrated Information Management System (JIIMS)	Maj Gareau (CAN)	Building 200 (3rd Floor)
17:00	End of day one and transport to hotels		
18:30	Guided Walking Tour		
19:30	Informal Dinner *À la maison de Serge Bruyère*		

Day 2 : Wednesday, September 27th 2000

08:00	Hotel pick-up		
08:30	Coffee		
09:00	Matinées Science and Technology: *Smart Sensor Web*	Mr J. Lupo (DOD-US) *Office of the Deputy Undersecretary of Defense*	Auditorium II
10:30	Break		
10:45	Report on the CFBL net	Mr D. Talada (US) *US National Imagery and Mapping Agency: NIMA*	C2 Conference Room
11:00	Elvin / Ticker demonstration	Mr G. Chase (AUS)	C2 Conference Room
11:30	Allied nations presentation (Other than Canada)		C2 Conference Room
12:00	General briefing and review of the focus groups working sessions objectives	Mr D. Gouin (CAN)	C2 Conference Room
12:30	Lunch		Cafeteria
13:15	Group picture		
13:30	Focus Groups Parallel Working Sessions (one per group in different locations)		
	Focus group 1: Visualization tools and techniques	Leader: Mr J. Maher (for P. Wussow) (US)	Auditorium I / A
	Focus group 2: Distributed Collaborative Planning	Leader: Mr P. Fiery (US)	CC Conference Room
	Focus group 3: Knowledge Management	Leader: Mr B. Beaton (US)	Auditorium I / B
	Focus group 4: Geospatial Information System	Leader: Mr D. Gouin (CAN)	Auditorium I / C
	Focus group 5: Common Ontology	Leader: Mr G. Chase (AUS)	Auditorium I / D
	Focus group 6: Information Assurance	Leader: TBD	EO Conference Room

15:00[1]	Groups report to the Workshop their action plans (15 min/group)	Chair: Mr D. Gouin (CAN)	Auditorium II
	Focus group 1: Visualization tools and techniques	Mr J. Maher (for P. Wussow) (US)	
	Focus group 2: Distributed Collaborative Planning	Mr P. Fiery (US)	
	Focus group 3: Knowledge Management	Mr B. Beaton (US)	
	Focus group 4: Geospatial Information System	Mr D. Gouin (CAN)	
	Focus group 5: Common Ontology	Mr G. Chase (AUS)	
	Focus group 6: Information Assurance (???, ??)		
16:45	Wrap up	Mr D. Gouin (CAN)	Auditorium II
17:00	Transport to hotels		
18:15	Pick-up from hotels		
19:30	Subsidized dinner *Manoir Montmorency*		Montmorency Fall Park
22:00	End of day two and transport to hotels		

Day 3 : Thursday, September 28th 2000

08:00	Hotel pick-up		
08:30	Coffee		
09:00	Introduction to Group Support System	Mrs A. Burns (CAN)	Auditorium II
09:30	Discussion and approval of groups proposed action plans (*Computer Supported Session*) - *Focus group proposal* - *Inter-groups interactions*	Chair: Dr A. Guitouni (CAN)	Auditorium II
10:30	Break		
11:00	Brainstorming the cooperation activities (*Computer Supported Session*) - *Scenario requirements* - *Next Workshop objectives and expected outcomes* - *Use of CFBL net* - *Experimentations requirements (plans, when, who, what, where, etc.)*	Chair: LCol J.R. Barbour (US)	Auditorium II
12:30	Lunch		Cafeteria
13:30	Finalizing the TTCP PA Agreement (*Computer Supported Session*)	Chair: Dr.R.A. Rathmell (UK)	Auditorium II
15:00	Break		
15:30	Review of the actions/decision items (*Computer Supported Session*)	LCol J.R. Barbour (US)	Auditorium II
16:30	Wrap up	Mr D. Gouin (CAN)	Auditorium II
17:00	End of day three and transport to hotels		

[1] This session was postponed to the next day

2. Day 1: September 26th 2000

2.1 Welcome speech

The first day was devoted to the Canadian presentations. The meeting began by a welcome address by Mr R. Larose, DREV assistant director general. Mr Larose exposed the importance of the Command and Control and the international collaboration for DREV. He also exposed the different sectors of the establishment and their activity. Then, Dr G. Vézina, head of the Information Technologies Section, detailed the different research and development activities of the Command and Control Sector (Information Technologies Section and Decision Support Technologies Section). He then emphasised his presentation on the new Technology Demonstration Program, under which is conducted the COP 21 TD project.

2.2 Keynote address

Cdr Barber gave the keynote address to the 3rd Workshop of the CINC 21 Coalition. Cdr Barber is employed in the Directorate Joint Force Capabilities (NDHQ) and is the Operational Lead for COP 21 TD. He postulated that if C2 is the central element of military operations, then the Common Operational Picture (COP) is the central element of military C2. Without a COP, Commanders at all levels cannot make informed decisions about employment of forces, cannot direct movement or make judgements about opposing forces. 'If we don't get the COP right, we won't get Ops right!'

Cdr Barber emphasized the need to move beyond the current 'limiting' definitions of COP and look to new ways of defining the COP capability. In the future, a static map display will not meet the Commanders requirements for situation awareness. The 'future COP' must provide information about all aspects of the operation: Red, Blue, Neutral, Brown, Assets, Infrastructure, etc. He raised the issue of 'information overload' and highlighted the need for efficient information management technologies.

To be effective, the user must have access to all information he requires, at the time it is required and the ability to tailor the COP to his needs. Information must be timely, accurate, and easily understood. Users expect to use web technologies and need an interface with a common look and feel to reduce the time and costs associated with training.

Cdr Barber recognized the need for scientists to explore new technologies and models as they emerge, to influence the future COP development. These models will change the way we collect and organize information and will enable Commanders to make quick, accurate and informed decisions. Users and scientists must work together to resolve situation awareness issues.

It is essential that information comply with agreed standards. All users must be confident that the information retrieved is accurate and that other users share the same

understanding. As we are increasingly involved in coalition operations, these issues become vital. These issues are procedural and doctrinal but require research into perception and understanding of human factors/technologies.

In conclusion, Cdr Barber stressed the need for an international collaboration to advance our understanding of the COP capability.

2.3 Opening remarks

LCol Barbour (US-CINC21) made some introductory remarks:

- CINC 21 should focus on the development of some real products; focus on things that we can do well.
- Aggressively pursue the use of CFBLNet.
- Determine better ways to interact between the allied nations involved within the CINC 21 collaboration efforts (more than VTCs and e-mails).
- Set short-term and long-term plans.
- CINC 21 will be having a demonstration in Oct 2000 in PACOM

2.4 TTCP PA

Dr Tony Rathmell gave a briefing on the TTCP MOU mechanism to support the CINC 21 Coalition. A new TTCP MOU should be signed in October 2000. This MOU will support the transfer of money and personnel, and will support exchange with non-TTCP nations.

The existing TTCP MOU is adequate to support the ongoing CINC 21 Coalition collaboration. The Project Arrangement (PA) he is preparing will better define the collaboration details. It is expected that the workshop will focus on completing most of the details required for the PA.

The schedule for completing and approving the PA are the following:

- 28 Sept 00 - Complete technical and programmatic details.
- Mid-Oct 00 - Completed draft PA for review.
- End Oct 00 - PA submitted to London IRC.
- End November 00 - Approved PA.

The MOU supports the exchange of software for experimentation purposes. It could also support the deployment of this software for operational use. There are some Intellectual Property clauses.

Dr T. Rathmell has then identified the deliverable he is expecting from the workshop. The deliverables that should be produced by the different focus groups are as follow:

1. A succinct technical statement comprising
    - more refined definition of the six CINC21 Projects
    - the national contributions
    - the technical goals, omissions and potential risks
2. A task schedule comprising
    - key tasks in sufficient details to enable management of the overall objectives
    - milestones and deliverables
    - interaction between tasks
3. An estimate of the national commitment
    - annual budget over the projected life of the TTCP PA

Then, Dr Rathmell advised the different groups to identify new experiment themes, to review the group members and to identify remote group members.

2.5 Scenario presentations

The Binni scenario was the subject of the presentation of Dr Rathmell. More information about the Binni scenario and its vignettes could be found on the following web site: http://www.aiai.ed.uk/~arpi/coalition/binni/.

The binni vignettes can support various military scenarios, including high-intensity and peace-keeping operations.

Then Dr Guitouni shortly described the North Atlantis scenario being used by the Canadian Forces Staff College for the FINAL LANCE Exercise. This scenario was built on a fictive crisis on the continent of Atlantis that was the result of years of growing tensions, which has erupted into armed conflict. As a result of the critical situation between ORANGELAND/REDLAND and BLUELAND, the UN requested the Alliance Council to consider a military response to help resolve the crisis. The ALLIANCE was a generic international military alliance in a 'parallel world' and was comprised of several generic European and North American nations with a political body called the Council and a senior military headquarters referred to as the Major Alliance Strategic Command. Alliance forces were organized, trained and equipped similar to NATO countries forces. Exercise FINAL LANCE began after a number of

months of growing tensions between Blueland and Orangeland and ten days after Orangeland's incursion into Blueland's Manghalour Peninsula, on 13 May 00. The scope of the exercise is primarily limited to a strategic and operational level involving course of actions generation, analysis and selection as well as Campaign planning. In new version of this scenario, other operations like peace keeping and domestic emergency operations were added.

2.6 Canadian presentations / demonstrations

The Canadian presentations began with a briefing on the detection of malicious code in COTS software (MaliCOTS) by Mr Charpentier. The objectives of this project are to develop tools to detect and prevent malicious code. A malicious code is a code that may affect the secrecy (leaking sensitive information), the authentication (impersonating authorized principals), the integrity (corrupting sensitive information), and the availability (denying access to legal users). Mr Charpentier also introduced the 'Secure management of Access Privileges through Electronic Visas and Fingerprint Recognition'. Mr Salois demonstrated four different MaliCOTS prototypes and the fingerprint recognition during the afternoon.

Mrs Bélanger demonstrated the functionalities of the commander's advisory system for airspace protection (CASAP). CASAP is a distributed decision support system prototype for in-depth comparison and selection of courses of action (COAs). It is developed to help the Command Post staff to describe and share information about a situation, to develop pertinent COAs, to evaluate these COAs and to determine which one is the most appropriate. The evaluation and prioritization of the COAs is accomplished within a Multiple Criteria Decision Analysis framework. CASAP offers different functionality and is designed to handle incomplete, uncertain and ambiguous information.

Mr Berger presented the KARMA prototype (Knowledge-based Adaptative Resource Management Agent). KARMA is an automated tool supporting capability for tactical mission planning to support dynamic planning and execution control in a time-varying uncertain environment. KARMA is an adaptive intelligent system designed to modify its behaviour in response to a dynamic and uncertain environment in order to successfully reach its goals.

Dr Boury presented the prototype ONTOSAR (Knowledge Management using Ontologies for Search and Rescue). ONTOSAR demonstrates the feasibility of building an organizational memory for SAR incorporating: relevant knowledge sources (ex. domain-related documents), experiences: capture and store experiential knowledge for reuse in subsequent decision-making tasks, domain models (ontology to better structuring of SAR knowledge), index and query heterogeneous information sources, design a report generation aid for incident prosecution, automatically compile acquired data into a consistent report, exploit knowledge from previously solved cases, and provide aid during report editing based on expertise models.

Mrs Gauvin presented the Electronic Task Support System (ETSS). The ETSS prototype was used to provide electronic information to the participants of a major

command post experiment. Participants were able to find information on three related experiment subjects: 1) the experiment itself including information on the context and the rationale, the scenario ZIGZAG with two alternative developments, the various information flow architectures and requirements to play four exercises, 2) the user guide of the ASIP system with different entry points, and 3) the doctrine. The ETSS prototype uses a Knowledge Object Base and is a web-based system.

Mr Gouin presented the Electronic Battle Box (EBB). The EBB system provides an electronic version of the army battle box, doctrinal documents, SOPs and SOHs. It provides also an integrated suite of planning tools: ORBAT & Equipment browsers, task planner / scheduler, logistics planner and movement planners. Mr St-Jacques presented the way ahead in developing the new version of EBB for a distributed environment.

Mr Fortin presented a novel display device for command and control applications called ToMaDi (Topographic Map Display). This device is built with a mosaic of 16 full colour TFT-LCDs. It offers a resolution of 4096x3073 pixels; or 91 pixels per inch. The screen dimension is 59" diagonal, 10" depth. ToMaDi provides a touch screen capability.

Maj. Gareau presented two systems: the Joint Integrated Information Management System (JIIMS) and the All Source Intelligence Producer (ASIP). JIIMS offers a spectrum of capabilities like: storage of indexed information, fast and accurate retrieval of information, easy and wide access to information (intranet & internet), processing of requests for information, handling of tasks for data gathering, management of document copies. JIIMS is able to handle any kind of document formats. It offers the following benefits: organization and access to information, sharing and dissemination of information, search for information through large volumes, retrieval and re-use of text, RFI «point-of-service» and distribution and tracking of copies. ASIP is designed to help intelligence analysts understanding the theatre situation. It offers a workspace where multiple operations/exercises can be played from multiple roles. ASIP uses overlays: superimposition of overlays in a view, sharing overlays using the live channel, sending/receiving overlays as attachments (Drag'n Drop). ASIP is compliant with MIL-STD-2525B-based symbology, which could be updated dynamically (using symbol types and symbol Categories). It also offers features to support customisable organisations, customisable scalability and visibility. ASIP is designed to provide Situation Awareness at unit level and above for all intensity of conflicts.

3. Day 2: September 27th 2000

3.1 CFBLNet

Mr. Don Talada provided a briefing on the CFBLNet, based on his participation to the CFBLNet meeting in Malvern (UK), week of Sept 18th, 2000. This led to discussion on the use of CFBLNet for the CINC 21 Coalition. This discussion can be summarized in the following major points:

- Many sites plan to connect to CFBLNet before January 2001.
- 17 projects have been proposed for CFBLNet. One of them is the CINC21 Coalition GIS experiment (Group 4), which has been approved with an October 15th start.
- CINC21 coalition members should provide some services, other than GIS.
- CFBLNet supports AUSCANUKUS members and NATO. There may be exclusions of some members for some experiments.
- CFBLNet enables coalition experiments up to Secret. As an accreditation is required, we can start using it at the unclassified level.
- JWID'01 scenario: Who's going to lead the preparation of the scenario? Influencing where the scenario will go? Will it be possible to fit? Should we have a group to work on the scenario?

The CINC 21 Coalition members need to:

- Determine the collaboration tools (like NetMeeting, etc.) that could be used over CFBLNet
- Address technical issues, such as firewalls

Then, Mr Maher (US) reminded everyone that there exists a CINC21 Coalition site which provide many services (forums, Web Pages, Documents, etc.).

3.2 Elvin

Mr G. Chase (AUS) presented Elvin, which is an asynchronous event notification system. This system allows every event to create a notification that could be produced from everywhere. Elvin offers functionality of publish-subscribe with a loosely coupling between the producers and consumers.

3.3 Focus groups

Mr Gouin gave some directives for the focus group meetings in order to produce the information needed to satisfy Dr Rathmell's requirements for the TTCP PA. LCol Barbour concurred and suggested that the project groups devote the entire afternoon to this and delay the reporting period to the 3rd day. As suggested, all the afternoon of day 2 was devoted to the focus group work.

4. Day 3: September 28th 2000

Mrs Ann Burns, decision support system manager at the Directorate of Strategic Change of National Defence (CAN) was invited to facilitate the meeting and to run a Group System to support the collaborative work among the participants. Mrs Burns introduced then the decision support system to be used during the meeting: GroupSystem V. The expected benefits of the system are:

- Simultaneous input - equal opportunity for participation, more opportunity for interaction
- Complete record keeping - participants' own words, all decision and action items recorded for reference; output from one tool can be used in another

Then, each focus group leader shortly reported their outputs to all participants. Then following Dr Rathmell's guidance, the groups resumed working using the decision support system to refine their action plans. These plans are summarised within the following sections of this document.

5. Group 1 - Visualization Tools and Techniques

"A decision is the action an executive must take when he has information so incomplete that the answer does not suggest itself." Admiral A. W. Radford

5.1 Mission statement[2,3]

Visualization provides a common [coalition] perception of the battlespace to the commander and his staff to enable them to conduct mission planning and execution monitoring across the full spectrum of military operations. This includes war fighting, peacekeeping, disaster relief, and humanitarian assistance. Issues will be analysed and developed within a series of experiments to evaluate the suitability of candidate products to satisfy the specific requirements of various users during this CINC21 PA. New issues uncovered by this analysis will be incorporated into this PA or other programs that extend beyond CINC 21 as appropriate.

For Distributed Collaborative Planning (DCP) visualization will identify an appropriate mix of systems, tools and techniques to generate a perception of the battlespace that is sufficiently consistent across a coalition force to support effective planning and to monitor mission execution.

In order to provide a clear presentation, the display must not be cluttered with irrelevant data. This relevant (user-defined) information may be incomplete and it must also provide an awareness of what relevant information is not known.

"Visualization", is the bi-directional interaction between the human user and the computing machines and extends to other sensory inputs, e.g. sound and touch. This may be individual and group interaction with information. Thus the human is not simply a passive viewer, but the active determinant in the selection and prioritization of the information to be projected.

How information is displayed includes cognition, phenomenology, hermeneutics, and heuristics. These factors impact the effectiveness of the Human-Computer Interface. On a more subtle level, they must be managed to ensure objectivity and preclude manipulation (selection, sequencing, and emphasis) of the information to lead the decision-maker to a pre-determined decision.

The display does not provide Situational Awareness. However, the user can derive Situational Awareness from a clear and accurate display of known information that also ensures an awareness of missing relevant information. The best "fusion engine" is still between the ears.

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[2] As stated, perception is the key issue here. It is not enough to show the same picture - indeed this may not be the answer, the key is for all coalition parties to perceive the same thing - there is a difference. (09/28/2000, 12.03 PM, Major Andrew Churchill UK Army)

[3] Fine with this (09/28/2000, 12:01 PM, Chris Gibson (UK))

5.2 Key objectives (what)

1. To develop a set of metrics to enable each nation to assess alternative visualization systems, tools and techniques, in satisfying its requirements. (Approaches may span analytic, judgmental, and empirical.)

2. To share emerging visualization technology so that each nation may incorporate, improve, and adapt it to satisfy specific or unique requirements and feed back the results of their efforts. The goal of this sharing and feedback is to develop display(s) which stimulate a common perception of the information (and lack of information) available to the decision-makers.

3. To identify and eliminate potential interoperability problems in visualization during the development.

4. To conclude research with a combination of:

    - Exploitable systems, tools and techniques that can be procured immediately to increase the effectiveness of coalition operations (together with recommendations as to how these might be best brought into use).

    - Promising systems and concepts that remain prototypical for further development into a set of exploitable outputs.

    - New questions/issues for incorporation into future development

5.3 Plan (how)

1. Establish an evolving set of metrics for describing visualization systems, tools and techniques.

2. Initiate a continuing program to share research and development information on visualization systems.

3. Create a catalogue/database of visualization tools and techniques using the metrics described above.

4. Develop visualization tools and techniques as "plug and play" modules so users can examine the systems available and select those modules best suited for the task.

5. Identify subsets of tools and techniques consisting of combinations, which prove popular with users or work more efficiently.

6. Propose and develop solutions to new areas of difficulty identified in current developments.

7. Produce a periodic hardcopy report and/or continuing electronic dissemination of the results of all experiments, together with recommendations for which systems, tools and techniques should be exploited in future coalition operations.

5.3.1 Characteristics of the visualization and display environments[4, 5, 6, 7, 8, 9, 10]

1. Display Environment (Hardware)

   Display characteristics:

   - Display Function: Planning, briefing, situational awareness, Decision Making
   - Information Projected (Documents, Slides, Graphics, Maps, Images, Video)
   - User Interaction: Keyboard, Mouse, Touch Screen, Graphics tablet, joystick, etc.
   - Display size Dimensions
   - Pixel density Pixels/inch or Pixels/cm
   - Display Resolution: graphics modes supported (640 X 480 etc.)
   - Viewing Distance: Distance from display to viewer

2. Display Environment (Software)[11, 12]

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[4] I think we should add information types too, since different information needs different visualisation techniques. Examples, are geo-spatially referenced data and briefs/reports (09/28/2000, 12:03 PM, Chris Gibson (UK))

[5] Does this mean that we wish to define (or learn from our experiments) what types of visualisation techniques appear to "work" for different information types. However, is the degree to which each "works" dependent on personal (individual), national and dispaly type diffences. (09/28/2000, 12:08 PM, UK - Peter Houghton)

[6] Yes, and yes. Using e g. the bird table to display a word document for group reading would be bad whereas it is great for stuff on maps - so the assessment of different tools/techniques must be done in the context of the type of information to be displayed/visualized and the purpose for which it is displayed/visualized (Unknown).
The personal preference thought is a good one, but I don't know how we could tackle it at the momennt and there are lower hanging fruits (09/28/2000, 12:16 PM, Chris Gibson (UK))

[7] Cognition, phenomenology, hermeneutics, phenomenology of display should also be included (Unknown).

[8] Must ensure objectivity. Preclude manipulation of decision-maker. (09/28/2000, 12:40 PM, John Maher (US))

[9] Must provide clear, unambiguous display of what is known and ensure an awareness of what is not known. (09/28/2000, 12:42 PM, John Maher (US))

[10] How do you make the representation of complex issues unambiguous to a diverse range of people in a multi-national coalition? What one should attempt to do is to remove un-necessary ambiguity - but this may not be obvious until you run an experiment an find the diversity of interpretation that result. One might then try alternates and home-in on those which create a minimum of diversity. However, sometimes diversity of interpretation of a situation is a good thing - for example in trying to determine enemy intent or courses of action. (09/28/2000, 1:11 PM, UK - Peter Houghton)

[11] Have to be careful that we do not encroach onto the situational awareness part of the problem - although clearly there needs to be interaction there (09/28/2000, 12:06 PM, Major Andrew Churchill UK Army)

[12] Situational Awareness is derived by the user from the display. The "fusion engine" is between the ears. (09/28/2000, 12:43 PM, John Maher (US))

Symbology[13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26]:

- Mil-Std 2525A/B Common Warfighting Symbology: http://www-symbology.itsi.disa.mil/symbol/mil-std/2525b.pdf
- MIL-PRF-89045 Geospatial Symbology for Digital Display (GeoSym): http://164.214.2.59/publications/specs/printed/89045/89045.pdf
- NIMA contact is Colby Harmon (HarmonC@nima.mil.)

Other Symbology Standards:

- Does Canada have additional Symbology Standards?
- Does UK have additional Symbology Standards?
- Does Australia have additional Symbology Standards?

3. Visualization techniques

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[13] also "biobology"? - see ARL, also DARPA CPoF {09/28/2000, 1:37 PM, AUS}

[14] need to address the operational level, not just tactical. (Operational command teams currently have tactical situation displays and they are not adequate {09/28/2000, 1:38 PM, AUS}

[15] I think this needs considerable expansion (out of committee). In fact, I view symbology standards as quite low level. {09/28/2000, 11:30 AM, Chris Gibson (UK)}

[16] I agree - I think we need to move beyond the display of geospatially referenced unit/platform information. There is much more richness in the information set that requires a plethora of visualisation approaches. {09/28/2000, 11.51 AM, UK - Peter Houghton}

[17] Symbology is one area, possibly the easiest. Should also include display of collaborative planning tool(s). {09/28/2000, 11:52 AM}

[18] UK is researching a vareity of techniques for visualising links/relationships among unstructured data. I will forward details via Tracy Lynam - these can then be added as (a) visualisation techniques and (b) as part of UK contribution to this. {09/28/2000, 12.06 PM, Chris Gibson (UK)}

[19] Need to make sure that we specify common symbology and rulesets for background map displays to ensure we are looking at the same information no matter what systems are being used. US has already done much work on this through the GEOSYM project {09/28/2000, 11:53 AM, CAN}

[20] Need to ensure a common perception. The symbols may be different, but the "meaning" needs to be common. {09/28/2000, 11:59 AM, Unknown}

[21] Fully agree - where can UK get details of the GEOSYM - US to answer? {09/28/2000, 12:11 PM, Major Andrew Churchill UK Army}

[22] Question to US - to CINC PAC and CINC ATL and the MEU currently all use the same terminology? If not, will they change? {09/28/2000, 12:13 PM, Major Andrew Churchill UK Army}

[23] I think we are going MUCH further than common meaning - we could display the SAME information in the SAME formats to diffrent people using different techniques. The meaninmg would be the same but the perception (eg understanding of the implications) could be different. We ate working in the realsm of shared perception. {09/28/2000, 12:19 PM, Chris Gibson (UK)}

[24] I beheve US is all moving toward 2525B, will have to check. {09/28/2000, 12.28 PM, John Maher (US)}

[25] The objective of group 1 is to provide a clear and unambiguous picture by
1. describing the display characteristics and environments to enable acquisition planners to select the display that best satisfies their needs.
2. displaying what is known and what is not known
3. displaying only relavant information (where is the filter -- must be user controlled) {09/28/2000, 1:07 PM, John Maher (US)}

[26] GeoSYM is an internal NIMA project. I believe it is described on the NIMA home pages, If not, NIMA contact is Colby Harmon HarmonC@nima.mil. They are on their 4th prototype and it is out for evavluation at the moment. Digital Geographic Information Working Group (DGIWG) nations are already participating in the review {09/28/2000, 1:32 PM, CAN}

- 3D Battlespace Visualization, including Urban Environments[27]
- Data (Visualization of multi-dimension datasets)
- Animation (play back, play forward)
- Filtering, decluttering techniques
- Multi-Modal visualization
- Visualization of uncertainty (missing, incomplete, or uncertain data, levels of confidence)

4. Visualization Environment
    - Command Level (Operational or Theatre/National Level (Tactical not addressed))
    - Display function (Planning Briefing, Situational Awareness etc.)
    - Unit Mobility (Mobile, Transportable, or Fixed)
    - Viewing environment (stand-alone, networked, desktop, conference room, theatre, etc)
    - Audience Size (Number of viewers sharing the display)
    - Audience Disposition (Seated or Standing or other)
5. Display Technology
    - Large & High resolution
    - Interactive
    - Immersive displays

5.3.2 National Contributions

Displays

- UK Electronic Bird Table
- UK Links/Relationships (How information displayed)
- CAN Topographic Map Display (ToMaDi)

[27] Greatest applicability may be in 3D data analysis {09/28/2000, 12:26 PM, John Maher (US)}

- AUS Future Operations Centre Analysis Laboratory (FOCAL)
- US Tri-Panel
- US Knowledge Wall / Composable frames

5.4 Goals[28, 29, 30, 31, 32]

1. Demonstrate and evaluate the effectiveness of various visualization tools and techniques in satisfying user applications (e.g. Planning, Situational Awareness, etc.)
2. Demonstrate innovative uses of mature [hardware and software] technologies.
3. Showcase enhanced visualization capabilities for coalition operations
4. Establish the impact of different visualization techniques situational awareness

5.5 Omissions[33, 34, 35]

1. Tactical Level of Command[36, 37, 38, 39, 40]: CINC 21 is centred on the US Theatre CINC Command Center (and functional equivalent national command centers,

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[28] I think this should read:
Evaluate the impact of different display technologies and visualisation tools to enhance situational appreciation.
Assess the impact on shared coalition awareness of different national approaches (09/28/2000, 11.55 AM)
[29] Better still"
Evaluate the ability of different display technologies and visualisation tools to enhance situational appreciation
Assess the implications of differing national approaches to the ability to create a shared perception of the situation across the coalition (09/28/2000, 11:55 AM)
[30] To do the above we need both a set of experiments, a set of metrics/means of measurement and
an assessment approach. Who are doing these things? Experiments need to be designed to generate opportunities to access the perceptions of the
operational staff in the four nations. Need to define a coalition command process which is going to be supported by the visualisation
technology. Could this process be a planning process - generating the possibility of developing a combined experiment with Group 2? (09/28/2000, 12:08 PM, UK - Peter Houghton)
[31] How will this be measured? this is a difficult issue to get right (09/28/2000, 12:14 PM, Major Andrew Churchill UK Army)
[32] We need to sit down off line to determine a baseline - as suggested above, a set of metrics or something. This needs to be done soonest - as without it we can not effectively measure the results (09/28/2000, 12:18 PM, Major Andrew Churchill UK Army)
[33] One of the key areas of interest within the UK with respect to the novel display devices is devising appropriate ways for the command staff to interact with them - i.e. how they integrate into the HQ procedures and methods of working . Are these issues to be addressed? (09/28/2000, 1:14 PM, UK - Peter Houghton)
[34] Another key area of UK interest concerned with its particular device is the manner of interaction with the display i.e. in terms of multi-modal input and control of the device. Thus visualisation (output only) is only part of the study. Is this issue to be considered and addressed? (09/28/2000, 1:17 PM, UK - Peter Houghton)
[35] tactical - but not real time is included (09/28/2000, 2:14 PM, Major Andrew Churchill UK Army)
[36] CINC 21 is centered on the US Theater CINC Command Center (and functional equivalent national command centers, such as HQAST, CP21, COP 21, etc). This includes horizontal relations between the supported and supporting CINCs, vertical relation to national agencies and policy, and vertical down to the CJTF commander. (09/28/2000, 11.39 AM)
[37] UK's CP21 extends Component Command. Suggest rename this as "Tactical level of command " rather than tactical risks (09/28/2000, 11:42 AM, Chris Gibson (UK))
[38] Suggest to indicate that only Command Centers Display technology will be examined. Technology such as Head-mounted displays (for soldiers) will not be examined. (09/28/2000, 1.31 PM, Denis Gouin (CAN))
[39] The display should be scaleable -- from wall to laptop. Immersive may not be suitable at this time, but how to display the information is really how it best satisfies the user(s) requirement. (09/28/2000, 12:48 PM, John Maher (US))

such as HQAST, CP21, COP 21, etc.). This includes horizontal relations between the supported and supporting CINCs, vertical relation to national agencies and policy, and vertical down to the CJTF commander.

- While the focus is specifically Command Center displays, the data inputs must be scaleable to ensure interoperability with other terminals.

2. Though a scenario is required to demonstrate the capabilities developed, Group 1 will not develop a scenario. However, the visualization tools and techniques should be appropriate for any user scenario in order to be operationally useful.

5.6 Dependencies[41, 42]

1. Dependent upon inputs from Group 2 for Distributed Collaborative Planning and Group 4 for Geospatial Information and Imagery for information display.

2. Dependent upon Group 3, Knowledge Management, for filtering, prioritization, correlation/fusion, and sequencing of information to be displayed.

3. Dependent upon Group 5, Common Ontology in order to synchronize visualization with the user-defined Knowledge Management priorities and to ensure that data tagging supports visualization capabilities.

5.7 Risks/Assumptions

1. A common high-level architecture (formats, protocols, metrics, etc.) can be defined to support data and information exchange.

2. This architecture can be adapted to satisfy the specific visualization requirements of the different nations.

3. This architecture will be flexible to enable different national solutions to interchange applications as well as information/data.

4. The set of modules, tools and techniques developed by participating nations will operate on fundamentally similar underlying concepts and principles, allowing them to be inserted into interoperable systems.

5. The CFBL will serve as a medium to support collaborative development of these systems.

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[40] I agree with Denis - our scope is defined by the type of environment our decision makers are working in, not their command level But as a first approximation, what we have is fine, I believe. [09/28/2000, 1:05 PM, Chris Gibson (UK)]

[41] Should we examine visualization technologies such as XSL in conjunction with KM experiments (Group 3) [09/28/2000, 1:01 PM, Denis Gouin (CAN)]

[42] Is there not a link to Group 3 in terms of supplying the information to visualise and Group 5 in providing information type/characteristics/properties which will select a particular visualisation style? [09/28/2000, 1:43 PM, UK - Peter Houghton]

5.8 Tasks[43, 44]

1. Define metrics for potential users to evaluate options
2. Coalition share and display information from a common geospatial gateway
3. Evaluate novel displays
4. Evaluate advanced visualization techniques
5. Use visualization prototyping environments such as InVision (Australia)

5.9 Milestones and deliverables[45, 46]

5.9.1 May or June 2000

Assess display options for visualization of common coalition access to geospatial data via gateway services. (Can ACOA, PlanMan, etc. pull geospatial products from the geospatial gateway?)

- Define metrics (continuing evolution).
- Apply metrics to tools and techniques
- Test tools and techniques with various data for accuracy, interoperability, and perception
- Conduct development tests with various combinations of tools and techniques via CFBL.
- Plan for first Coalition Interoperability Demonstration (JWID '01) (in coordination w/other projects)
- Conduct JWID '01 Interoperability Demonstration (in coordination w/other projects)
- Identify Second Coalition Interoperability Demonstration (JWID, Tandem Thrust, RIMPAC, other?)

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[43] There will be a requirement to define some Measures of Effectiveness (MOEs) to determine the improved situation awareness {09/28/2000, 1:26 PM, Denis Gouin (CAN)}

[44] Agreed. I think the issue of metrics is vital, but we have not proposed work in this area so far. I think you should propose it, and I will support {09/28/2000, 1:36 PM, Chris Gibson (UK)}

[45] TTCP AGVis is organizing a visualization workshop in San Diego (6-8 March 2001) that can be very valuable to identifying some key visualization / situation awareness, efficient visulaization techniques and to help define Measures of Effectiveness (MOEs) to assess shared situation awareness {09/28/2000, 1 29 PM, Denis Gouin (CAN)}

[46] I suggest as a general schedule that for year 1 we assess displays and visualization techniques with preliminary Measures of Effectiveness (MOEs), and the hardware displays and tools Countries already have or are near completing. On the second year we should try to have more comprehensive MOEs, supported by a realistic scenario. {09/28/2000, 1:35 PM, Denis Gouin (CAN)}

5.9.2 Summer 02 (Recommend May or June 2001 {9/28/00, 11:41 AM, USA})

- Assess results/feedback from JWID '01 Interoperability Demonstration
- Plan for second Coalition Interoperability Demonstration
- Add symbology (What symbology – Identify symbol sets and related messages used by coalition partners then determine how to share information)
- Conduct second coalition experiment and assess results/feedback.
- Summarize results, conclusions, and recommendations. Commence transition.
- Transfer those tools and techniques not ready for transition to continuing effort.

5.10 Country contributions

- Australia $ 200K US per year
- Canada $250K for the first year, and $300K for the second year
- UK $150K US per year
- US $250K US per year

6. Group 2: Distributed Collaborative Planning[47,48]

6.1 Mission statement

Enable Distributed Collaborative Planning across Coalition Forces.

6.2 Objectives[49,50,51,52,53]

1. Demonstrate the functionality provided by different decision support (existing/allied), planning and collaborative tools for a command staff planning effort during a coalition operation.

2. Validate and confirm the requirements for coalition collaborative planning and establish where the use of common tools and techniques would be beneficial (at the management level).

3. Assess whether a coherent joint and coalition operational plan could be developed through the interoperation of national and allied collaboration and planning tools and techniques.

4. Demonstrate distributed collaborative planning and the sharing of decision support services.

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[47] What do we need to do to complete the CINC21 TTCP PA? (Unknown)

[48] A succinct technical statement comprising:
More refined definition of the six CINC21 projects
The national contributions
The technical goals, omissions and potential risks
A task schedule comprising
Key tasks in sufficient detail to enable overall objectives to be managed
Milestones and deliverables
Interaction between tasks
An estimate of the national commitment
Annual budget over the projected life of the TTCP PA (Dr Rathmell, UK)

[49] Could you please consider formatting the Technical Statement in the form used by Project 1. (09/28/2000, 12:19 PM, Unknown)

[50] Mission Statement from Malvern Meeting: Assess whether a coherent coalition operation plan can be developed through the interoperation of each nation's planning tools and techniques. Determine the requirements for collaborative planning and establish where the use of tools and techniques would be beneficial. Also identify any procedural or conceptual impediments to coalition planning. (09/28/2000, 1:25 PM, USA)

[51] I still like this mission statement (09/28/2000, 1:46 PM, UK)

[52] But the objectives are a v good expansion (09/28/2000, 1:47 PM, UK)

[53] 4 Succinct Technical Statement:
Technical goals:
1. An advanced technical capability for distributed collaborative planning which can be transitioned within 2 years
2. Experiments which show where we need to go for future planning capabilities
3. Identify infrastructure requirements and support by existing capabilities with capability gaps noted (Unknown)

6.3 Considerations

- Time to establish capability across
- Principle countries (our team)
- Unanticipated (ad-hoc) coalition members; Differences between NATO and non-NATO?

6.4 What is required?

- Infrastructure[54,55]
- Basic collaboration services
- Coalition Planning Processes and supporting tools

6.5 Omissions:

- Scenarios will not be developed by our group[56,57,58,59,60]
- Assumptions: Respective countries will have support from their JWID personnel in establishing necessary infrastructure

6.6 Potential risks:

- Infrastructure may not be connected
- Policy may not permit capability to be assessed

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[54] While it is essential to have a working infrastructure - the actual work on implementing infrastructure should not be undertaken by the group. After all, infrastructure is an enabler and not a key issue for the research community looking at collaborative planning. {09/28/2000, 11:42 AM, UK}

[55] While there are collaboration services available for small groups in a cohesive organization; standing up collaboration services for a coalition force is not a given today. There is interesting research as well as advances in processes and concepts which need to be developed. For example, consider directory structures and the association of organizations, missions, roles, and specific individuals. If we can successfully stand up the collaboration services for our team on CFBL and the Internet, as well as have success in JWID 2001, Experiment I; this goal will be accomplished; on the other hand, if difficulties are encountered, then we will have something to address and categorize as nominal infrastructure engineering, research, policy... {US} {09/28/2000, 1:15 PM, Adel Ouitoum (CAN)}

[56] Many of the groups are likely to be looking for an operational process in which to situate their products to assess the impact of those products on warfighter capability. Currently the only group which is directed towards an operational process is Group 2 Can I therefore ask whether Group 2 will be attempting to define a coalition planning process and to develop experiments which exercise this planning process within the planning support infrastructure which is being developed within this group? {Unknown}

[57] There is a subsequent requirement to have some approaches to assessing any impacts on the planning process resulting from the use of the technology. This also requires specific experimental techniques to be used and consideration of appropriate measures and metrics.

[58] From what I can see of Group 2 so far - I do not see the above being conducted. If Group 2 is not responsible for this - who is? {09/28/2000, 12:18 PM, UK - Peter Houghton}

[59] OK, but how will we get them developed for us? Who do we task and how? {09/28/2000, 12.08 PM}

[60] important to AUS (at least) to stay aligned with CINCPAC in CINC 21, including scenarios {09/28/2000, 1:49 PM, Stephen Hood (AUS)}

- Experiment II will not be conclusive

6.7 National Contributions[61,62]

- UK[63,64,65]: PLANMAN, DECMAN, Process for planning
- CAN: CASAP, KARMA, EBB, WASP
- AUS: PLANMAN
- US: ACOA, JL, JTL, FPE21, DCT

6.8 Task Schedule Key Tasks

- Statement of the problem with lessons learned and anticipated future issues
- Define criteria for selection of components
- Identify candidate components and select
- Identify core collaboration services components and select
- Assess current processes against candidate components and core collaboration services
- Develop joint interoperable capability based on outcome of assessment
- Assess distributed collaborative planning capability

6.9 Milestones

1. Statement of Problem Jan 2001
2. Experimental Suite Sep 2001
    - Selection criteria
    - Collaboration components v1 on CFBL
    - Process Planning applications candidates on CFBL
    - Assessment of current and experimental services

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[61] Systems from NATO? (09/28/2000, 1:49 PM, Adel Guitouni (CAN))
[62] Should also examine others tools such as some from NATO (e.g ADAMS) (09/28/2000, 1:49 PM, Denis Gouin (CAN))
[63] UK has other planning research that we may throw into the pot soon (eg Campaign Planning) (09/28/2000, 1:49 PM, UK)
[64] You appear to have the UK and AUS contributions the wrong way around (09/28/2000, 1:49 PM, UK - Peter Houghton)
[65] Fixed the AUS UK order (09/28/2000, 1:51 PM, Greg Chase (Aus))

6.9.1 Coalition enabled Distributed Collaborative Planning Suite Fall 2002

- Concept of operations based on new capability
- Collaboration components v2 on CFBL
- Process Planning applications on CFBL
- Assessment of Suite

6.10 Interaction between the other tasks

- Knowledge management ontology, portals
- Visualization
- Geospatial

6.11 Experimentation Details

6.11.1 Experiment I objectives (JWID 2001)

- Demonstrate the functionality provided by different decision support tools (existing/allied) or planning tools with a core set of distributed collaboration tools for a command staff planning effort such as during a coalition operation.
- Validate and confirm the requirements for collaborative planning and establish where the use of common tools and techniques would be beneficial (at the management level).

6.11.2 Experiment II objectives - Interoperability with our Allies (2002)

- Assess whether a coherent joint and coalition operational plan can be developed through the interoperation of national and allied collaboration, planning tools and techniques.
- Demonstrate interoperability / linkages among national and allied decision support tools.
- Demonstrate distributed collaborative planning and the sharing of decision support services.

6.12 Estimate of the National Commitment

- Australia 200K US per year[66,67]
- Canada $250K for the first year, and $300K for the second year
- United Kingdom 125K US per year
- United States 250K US Dollars[68]

Each Nation needs to identify the CFBL and JWID support engineering/management team and points of contact for group 2 to interact with for installation, configuration, and support on the Infrastructure services.

[66] Most likely 1 to 2 persons per year, perhaps 40K US per year additional funding (to be confirmed) (09/28/2000, 1:48 PM, Greg Chase (Aus))
[67] Revised to 200K US per year in kind + real spend (09/28/2000, 3 07 PM, Greg Chase (Aus))
[68] 250K US Dollars (09/28/2000, 3:37 PM, USA)

7. Group 3&5: Knowledge Management and Common Ontology[69]

7.1 G3/G5 Strategy: *Management*

- Keep Two Separate Groups but . . .[70,71,72,73]
- Tight Coordination Between G3/G5
- Conduct Joint Meetings and Execution (for now)

7.2 Mission Statement (G3)

The Knowledge Management Working Group will develop information and knowledge management services that address the processing and production of fused products using cross Coalition data and information. Services that will be pursued include Knowledge Management portals, Knowledge Discovery Services, Multi-Lingual Services, Heterogeneous Query/Retrieval Services, and fusion applications that can support Coalition Distributed Collaboration Planning. The successful execution of this effort should significantly improve situational awareness for Coalition Operations, both in terms of common, consistent understanding of the situation, and in reduced latency.

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[69] NOTE: I believe that I have copied all comments from this activity into the correctly formatted activity which follows for Groups 3&5, but I left this here as 'insurance'. (Ann Burns)

[70] I suggest to merge both groups because they are pursuing the same objectives. For example, group 2 has more than one subject, but it is not a raison to split the group. It will be easier for the other groups to interact with this group (09/28/2000, 2:17 PM, Adel Guitouni (CAN))

[71] I agree they should be merged, as does Bob I believe. So who DOESN'T want to do this? (09/28/2000, 2:17 PM, Chris Gibson (UK))

[72] I don't want to do this, I will email a discussion (too long for now) (09/28/2000, 3:59 PM, Greg Chase AUS)

[73] Why keep projects 3 and 5 separate?

Basically although they are related I consider that the two projects have very different aims and require correspondingly different skill sets in the people involved in the tasks. Project 3 is about creating coalition wide shared situational awareness. Although this will clearly benefit from some ontology input I see most of this task dealing with how to bring the information together so that it can be used to improve situational awareness. Much of the proposal deals with creating portals and shifting information around. Project 3 is also likely to wander very close to the visualisation aspects of project 1 yet it is clearly separate from project 1.

In contrast project 5 was initially about common ontology but now is moving towards asking the question what is ontology and how can we develop pieces of ontology We seem to have moved from the unreachable dream of having a "common ontology" towards understanding how can work with pockets of agreed ontology. Project 5 should also include an understanding of the tools that might be employed to represent and reason with ontologies. To stay grounded in reality project 5 will pursue the development of some ontology and logically this should be targeted to assist the other CINC21 projects but this doesn't mean that it should fold into another project.

Minor reasons:

Either the UK or AS would not have a lead project. A while back John suggested that no nation should be the lead on more than two projects, I would like to extend the rule to include each nation should be the lead for at least one project. This concern may go away, perhaps Australia may be the lead for project 6, although at this point it is unclear when project 6 will get up.

I dont see a lot of support for the proposal, most I the people that I spoke with seem to be happy with the two groups Perhaps we should approach Bob and Marlene who are part of both groups to gain their views. (e-mail 10/13/2000, 03:32 AM, Greg Chase AUS)

7.3 Technical Goals (G3)

Goals: We will

1. Develop and implement a non-geospatial based knowledge Portal
2. Demonstrate capability to feed data to G4 via Common Coalition Ontology

7.4 Omissions (G3): We will not

- Develop Geospatial displays of Data

7.5 Technical Statement (G3)

1. TASK #1

   The KM Working Group will develop a web-based Coalition Knowledge Portal for accessing and displaying information published into the Coalition Server.

2. TASK #2

   The KM Working Group will provide support to the Geospatial Working group to provide access to geospatially tagged information via the standard Coalition Ontologies.

3. TASK #3

   The group will develop more complex services

   - Knowledge Discovery (CA lead, UK)
   - Heterogeneous Query/Information Retrieval (UK lead, AS, CA)
   - Multi-lingual KM (CA lead, US)
   - Fusion of information in support of Group 2 (US lead, UK, AS, CA)

7.6 National Contributions (G3)

1. Coalition Knowledge Portal
   - Will be executed as a Integrated Product Team activity
2. Support to Geospatial
   - Order of Battle CA

- Country Pages CA
- Readiness UK
- Logistics US
- Civilian Tracking AU

7.7 Risks (G3)

- Ability to reach agreement on Ontology Standards
- Ability of G4 to keep pace with the G3/G5 super team

7.8 Schedule (G3)

1. Knowledge Portal Design Feb 2001
2. Knowledge Portal Development (Data Access)
   - Country Pages Mar 2001
   - Logistics Jun 2001
   - Readiness Sep 2001
   - Order of Battle Dec 2001
   - Civilian Tracking Mar 2002
   - Security Tags Jun 2002
3. Support to G4 after following dates
   - Country Pages Mar 2001
   - Logistics Jun 2001
   - Readiness Sep 2001
   - Order of Battle Dec 2001
   - Civilian Tracking Mar 2002
   - Security Tags Jun 2002

7.9 National Commitment (G3)

	2001	2002	Total
• CA	$200K	$300K	$500K
• UK	$200K	$200K	$400K
• US	$250K	$250K	$500K
• AU	$200K	$200K	$400K

7.10 Mission Statement (G5)

The Ontology Working Group will focus on improving Coalition Interoperability by developing and implementing standard methods for the creation, access, and sharing, of data and information among Coalition nations. The general approach will be to develop XML Data Type Definitions for each focus area and then to develop processes for individual countries to export their information into the Coalition environment using the standard XML formats. Where common standards are not feasible, translation among ontologies will be investigated. The successful execution of this effort will provide the infrastructure foundation for significantly improved situational awareness for Coalition Operations, both in terms of common, consistent understanding of the situation, and in reduced latency.

7.11 Technical (G5)

G5 Develops and Implements Ontologies

- Do not develop one Monster Ontology
- Do develop lots of little ontologies

G3 Develops Operational uses of Ontologies

- Individual Country Publication into Coalition Database via Coalition Ontology
- Operational Applications[74]

7.12 Technical Goals (G5)

We will

1. Develop and implement Standard Coalition Ontologies in the selected areas indicated

[74] What is meant by the operational applications in this context? (09/28/2000, 2:18 PM, UK - Peter Houghton)

2. Make the Ontologies available for use to all projects on an ongoing basis via the CFBL Net

3. Make access to G5 ontological services via published APIs

7.13 Omissions (G5):

We will not

- Work applications that use the ontological data services
- Develop non-specified ontologies without management agreement

7.14 Technical Statement (G5)

1. TASK #1

   The Ontology Working Group will develop and implement Ontological Standards for selected exchange of information and services in the following areas: (1) Order of Battle, (2) Richer Country Pages, (3) Security Tags, (4) Tracking Civilians in Op Areas, (5) Logistics, (6) Operational Readiness.

2. TASK #2

   The following items will be developed for each ontology area (1) Semantic Specifications, (2) Ontology Encoding Mechanism (initial focus on XML DTD development), (3) Transform functions for moving data between XML and database tables, (4) Public APIs for third part access.

3. TASK #3

   A Coalition Database/Web Server will be created that is structured to support the Coalition Ontologies developed in Tasks #1 and #2. This server will be based upon an Oracle 8i database, and will be integrated into the CFBL Net to support ongoing experiments and to support the activities of other Working Groups.

4. TASK #4

   Devise mechanisms for publishing country-owned data into the Coalition Server using the proper ontology semantics and encoding.

7.15 Development Approach (G5)

1. Application involving uncertainty

2. Implement Production from Country Sources to Coalition

- Manual Production
- Tied to National data sources
- Use Heterogeneous Query Approaches

3. Stand Up Coalition Repository
4. Implement Common Coalition KM Environment
    - Web-based Interface
    - Electronic Battle Briefs
    - Others TBD
5. Design and Implement Ontologies for (list may grow) [75,76]
    - Aspects of ORBAT
    - Richer Country Pages
    - Civilian Locations
    - Aspects of Logistics
    - Aspects of Operational Readiness
    - Security Tags [77,78,79]
    - Application involving uncertainty
6. Implement Production from Country Sources to Coalition
    - Manual Production

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[75] Although one nation may lead on the development of these - it is important that each nation gets involved in the definition - so that we can see the "real" problems of trying to develop common ontologies.(Haughton) {09/28/2000, 2:28 PM}

[76] We must also provide ontologies (or metadata) related to information sources independently of the domain (e g. extension or adaptation of Dublin Core metadata initiative) (Boury-Brisset) {09/28/2000, 2:28 PM}

[77] I think that this one needs to be started sooner than Bob discussed. It may be difficult to complete but it has the potential to be a show stopper for other projects (eg Project 2 planning) {Greg Chase (AUS)}

[78] I agree with Greg - should CFBLnet implement some means of segregation based on security classification (rather than running system high across the board) then we will need to assign security tags to the underlying information, otherwise our portal would of limited usefulness. Moreover, if this is going to prove a contentious issue for nations to agree, the sooner we know thi the better. {Chris Gibson (UK)}

[79] Could Group 3 be the "driver" for a new Group 6? One might attempt to define a coalition information security/information sharing policy, "pretending" that the CINC21 experimental environment is the real environment. One could then undertake a security assessment of the architectures being developed in the various groups to determine if there are some fundamental security flaws. If these are spotted early enough then perhaps the decisions about the architectural design are sufficiently fluid that they can be steered towards an approach which stands some chance of being operable in the real security environment. {UK - Peter Houghton}

- Tied to National data sources
- Use Heterogeneous Query Approaches

7. Stand Up Coalition Repository
8. Implement Common Coalition KM Environment
    - Web-based Interface
    - Electronic Battle Briefs
    - Others TBD

7.16 Experimentation Plan (G5)

1. For each Operational Area verify Coalition Publication into common Ontology via CBFL-based experiments
    - Work through prioritised Ontological Areas in 3-4 month intervals
    - One Country responsible for a specific Ontology implementation (e.g., development and implementation of DTDs)
    - Each Country responsible for publishing their data
    - Manual
    - Automated
2. Common Coalition KM Environment
    - Multiple Phased Releases some of which will be correlated with major external events (i.e., JWIDs, etc.)
    - Multi-Country Development Team to ensure common look and feel
    - Publish APIs

7.17 Status (G5)

Completed:

- Ontology Development Philosophy
- Selection of Ontologies to be Implemented
- Development Schedule

- Experimentation Approach
- Coalition KM Development Approach

Not Completed:

- Schedule
- Ontology Implementations
    - Scheduling of Implementation
    - Assignment of Country Responsibilities
- Country Responsible for Coalition Repository

7.18 National Contributions (G5)

1. For Ontology Development and Implementation:
    - One Country assigned to each area
2. Coalition Server Development (US)
3. Ontology Development
    - Order of Battle CA
    - Country Pages CA
    - Readiness UK
    - Logistics US
    - Civilian Tracking AU
    - Security Tags[80,81,82] US
4. Data Publication

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[80] re: Security tags: I think that this one needs to be started sooner than Bob discussed. It may be difficult to complete but it has the potential to be a show stopper for other projects (eg Project 2 planning) (Chase) {09/28/2000, 2:25 PM}

[81] re Security tags: I agree with Greg - should CFBLnet implement some means of segregation based on security classification (rather than running system high across the board) then we will need to assign security tags to the underlying information, otherwise our portal would of limited usefulness. Moreover, if this is going to prove a contentious issue for nations to agree, the sooner we know this the better. (Gibson) {09/28/2000, 2:37 PM}

[82] re Security tags: Could Group 3 be the "driver" for a new Group 6? One might attempt to define a coalition information security/information sharing policy, "pretending" that the CINC21 experimental environment is the real environment. One could then undertake a security assessment of the architectures being developed in the various groups to determine if there are some fundamental security flaws. If these are spotted early enough then perhaps the decisions about the architectural design are sufficiently fluid that they can be steered towards an approach which stands some chance of being operable in the real security environment.(Haughton) {09/28/2000, 2.37 PM}

- Order of Battle CA UK US AU
- Country Pages CA UK US AU
- Readiness CA UK US AU
- Logistics CA UK US AU
- Civilian Tracking CA UK US AU
- Security Tags CA UK US AU

5. Coalition Repository O&M: US
6. Estimate of national commitment
   - UK 250K US dollars per year
   - US Group 3 250K and Group 5 150K US Dollars

7.19 Risks (G5)

- Ability to reach agreement on Ontology Standards
- Sufficient Data Population

7.20 Schedule (G5)

1. Stand Up Coalition Server on CFBL Feb 2001
2. Ontology Development and Implementation
   - Country Pages Feb 2001
   - Logistics May 2001
   - Readiness Aug 2001
   - Order of Battle Nov 2001
   - Civilian Tracking Feb 2002
   - Security Tags May 2002
3. Data Publication
   - Country Pages Mar 2001

- Logistics Jun 2001
- Readiness Sep 2001
- Order of Battle Dec 2001
- Civilian Tracking Mar 2002
- Security Tags Jun 2002

7.21 National Commitment (G5)

	2001	2002	Total
• CA	$75K	$50K	$125K
• UK	$200K	$200K	$400K
• US	$500K	$500K	$1000K
• AU	$200K	$200K	$400K

7.22 Synergy with Other Groups[83,84]

Group 3&5: Knowledge Management and Common Ontology

- Group #5 to directly support Group #3[83]
- Possibility of Group #5 support to Group #3
- Possibility of Group #5 support to Group #4
- Possibility of Group #5 support to Group #6

[83] How are the information services provided by Group 3 to be integrated with both the basic collaboration services and the more specific planning applications being examined in group 2? (Haughton UK) (09/28/2000, 2:23 PM)
[84] Is not Group 3 providing support in terms of information products and services that can be used by Groups 1 and 2? (Haughton UK) (09/28/2000, 2:23 PM)
[83] Is Group 5 supporting Group 3 or are the two groups operating together to develop an integrated way of providing both geospatial, geospatially relevant and non-geospatial information? (Haughton UK) (09/28/2000, 2:23 PM)

8. Group 4: Geospatial and Imagery Information and Services

8.1 Objective

Geospatial and Imagery Information and Services (GIIS) will address the key issue of providing coordinated, transparent, remote access to distributed geospatial information and services across the coalition in support of C4I. This issue will be developed through a series of experiments to evaluate, select and implement different technologies in order to accomplish the seamless integration of disparate services and information across a distributed coalition network.[86]

8.2 Goals

1. Provide the warfighter with common access to coalition GIIS
2. Coordinate/integrate coalition GIIS capabilities so that they appear as a single entity to the coalition warfighter
3. Ensure that GIIS are compatible with Coalition C4I Systems

8.3 Approach/Methodology

1. Short term to integrate what is possible for JWID '01[87,88]
2. Long term to develop a plan on how to integrate new or upcoming technologies
    - Such as geospatial processing services and tighter integration into all participants contributions
3. Assess the compatibility of GIIS with existing and planned national C4I systems
4. Under the auspices of CINC 21 we are going to take advantages of the CFBL and JWID to test, demo and refine our concepts and technologies.

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[86] Would you please consider formatting the objective in the style of that used for Project 1. Tony {09/28/2000, 12 15 PM, UK}

[87] Determine which legacy metadata geo-spatial standards will be translated for use in the JWID '01timeframe in the common metadata standard Develop the translation software. {09/28/2000, 12.02 PM, Doug Wood US}

[88] In the process. The big challenge here is that most countries offer data inventories with limited metadata content. Also, which metadata standard to pick as FGDC is being rolled into ISO TC211 Metadata standard that is not yet ready for prime time NIMA has a core metadata standard that is not yet complete as well. In the short term, a small core metadata set should be selected for the experiment. {09/28/2000, 12·19 PM, CAN}

8.4 Experimentation

8.4.1 Experiment 1 – Imagery and Geospatial Gateway Services for the Coalition Warfighter

8.4.1.1 Goals

- Unify client access / common access
- Provide interfaces tailored to warfighter needs and level of expertise
- Exploit portal technology for coalition GIIS coordination/integration
- Integrate existing/legacy services and data
- Exploit common gateway services as part of the overall CINC 21 activities

8.4.1.2 Common Gateway Services

Client Applications

- Country Page HTML Interface[89,90]
- Map Browser HTML/JAVA Interface
- GIS Interface
- Common Gateway Services Portal
- Portal: Search, evaluate, order, download and support Customer profiles[91]
- Service Registry
- Set region, time, data collection
- Send query through portal
- Sort, format and analyse results
- Initiate required service

[89] Link to WG3 Country Page effort {09/28/2000, 11:55 AM, Denis Gouin (CAN)}
[90] Group 3 agrees and has discussed that there should be only "one" portal {09/28/2000, 12.02 PM, Greg Chase (AUS)}
[91] should read download data per request {09/28/2000, 11.54 AM, Doug Wood US}

- GatewayServices
- WMT I Geo Data Warehouse
- Metadata Service
- Imagery Service
- Map Service
- Intel Service
- Legacy Geo Data Services
- Roadmap: (1) Start out as a CINC 21 project on the CFBLNet - Use the CFBLNet as an enabler, (2) Test/evaluate technologies, (3) Demonstrate to the warfighter in JWID, (4) Get warfighter feedback, (5) Reinitiate/refine

8.4.2 Experiment 2

- Demonstrate an integration of the gateways services into national C4I systems
- Other Opportunities
- Demonstration of initial remote geospatial analysis services

8.5 Schedule/Milestones[92,93,94,95,96]

- 15 Oct 00 Recommended CFBL Project Start
- Oct/Dec 00 Connect to CFBLNet : Establish project environment, Initial definition/set up of I&G Gateway databases and services
- Jan/Mar 01 Use COTS/GOTS Tools to implement Portal & User Interface
- Apr/Jun 01 Use COTS/GOTS Collaboration/Exploitation Tools to implement coordinated services

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[92] Coordinate Portal with KM portal so that users are presented with only one portal (09/28/2000, 11.57 AM, Doug Wood US)
[93] Agreed - we should investigate the merging of both into a single point of access or as close as possible (09/28/2000, 12.08 PM, Denis Gouin (CAN))
[94] Sounds good But I would say initially Task 4 should look to its own portal as it will be progressing in faster timescales than Task 3 and the Task 4 problem is much better understood than that for Task 3 as the number of I&G formats etc is known. (09/28/2000, 12:10 PM, Chris Gibson (UK))
[95] As group 4 is already on it's way, this link to the KM portal would be an excellent candidate to integrate into post JWID implementation plans (09/28/2000, 12 13 PM, CAN)
[96] Good plan (09/28/2000, 1 12 PM, Chris Gibson (UK))

- July 01 Trials — Demo I&G Gateway Services as part of JWID 01 Interoperability
- July '02 Demo Improved I&G Gateway Services

8.6 Interactions Required with other Groups

Provide GIIS requirements and data to other focus groups as required

8.7 Difficulties

- CFBLNet connectivity
- Selection of Services
- Interconnectivity - Definition of service API's / interfaces
- Collaboration

8.8 Future Meetings

Attempt to use VTC, Forum, and email/email reflectors

8.9 Potential Participants

- Liz Bilsby UK
- Douglas Wood US
- Paul Morin CA Experiment Lead
- Denis Gouin CA Chair WG4
- Chris Ekins AUS
- Don Talada US
- Chris Gibson UK

8.10 Contributions

- CA: $250K for the first year, and $300K for the second year
- US: 250K US Dollars

- UK: (TBD) UK participation may be from another UK research programme - therefore there is likely to be limited participation from Package 13 - no more than $25K US dollars per year
- AUS: 300K (US $) per year

9. Group 6: Information Assurance

It is recommended that the focus of Project 6, Information Assurance, be Crossing Security Boundaries. This is an obstacle that all Coalition Operations must address. Historically, the problem has been circumvented, not solved, using work-around.

Currently, the scope of Information Assurance is too broad and no lead nation has been selected. Information Assurance now includes VPN, PKI, Intrusion Detection, Network Monitoring, Data Integrity, and Crossing Security Boundaries.

Given the option of cancelling Group 6, all four nations have declined. The recognition of the need, the potential gain, and the difficulty was unanimous. Furthermore, everyone recognizes the critical roles Information Assurance plays in Coalition operations that LTC Barbour has described.

Therefore, it is recommended that the focus of Coalition Project 6, Information Assurance be Crossing Security Boundaries. Potential solutions include the Australian StarLight/Interactive Link, which was briefed prior to and at the Malvern Workshop and the US Multi Domain Dissemination System (MDDS), which will be briefed at the next VTC.

9.1 Issues

Do Canada and UK have candidate technologies to facilitate moving information across security boundaries with the Coalition?

Which country will take lead? The current distribution of project leads is:

- US 2 Project 1 & Project 2
- UK 1 Project 3
- Canada 1 Project 4
- Australia 1 Project 5

The lead for Project 6 should not be the US. A third lead for the US would give the US lead on half of the projects. Furthermore, since the US may be the most difficult to satisfy, it may be most effective to position this outside the US to ensure a more innovative approach.

9.2 Actions:

- US Coordinate MDDS brief for next VTC.

- UK & CAN Identify candidate systems which may contribute to solution
- UK, CAN, & Aus Consider taking lead for Project 6 with focus on Crossing Security Boundaries

9.3 Contributions

- CA: $25K for the first year, and $150K for the second year
- US:
- UK:
- AUS:

10. Management Views

10.1 Schedule (meetings, workshops, experiments, ...)

10.1.1 CINC21 Coalition Workshops

- 1st - March 00, Washington
- 2nd - 20-21 June 00, DERA Malvern
- 3rd - October 00, DREV Quebec
- 4th - 6-7-8 December, DSTO Salisbury[97]
- 5th - March 2001 in San Diego[98]

10.1.2 Date discussion and how long should the meeting be?

10.1.3 Agenda

- Details for JWID meeting
- Scenario discussion
- Metrics discussion

10.1.4 Coalition Experiments

JWID 01

10.2 TTCP PA issues

- 2.1 need to gain support for PA from TTCP C3I Group Exec Chair (Ray Urtz) and have him include CINC 21 in his brief to the TTCP Principals (UK 16-20 Oct)[99]
- Level of detail sufficient to gain approval - more detail needed for project management should be elsewhere[100]

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[97] Business VISA required from US, maybe other countries, process by 30 OCT 2000 (09/28/2000, 3:23 PM, USA)
[98] Any time in March will be suitable for Australia (09/28/2000, 3:19 PM, Greg Chase (AUS))
[99] Ok - Jerry Dussault (AFRL Rome TP9) and Bob Wasilausk (SPAWAR San Diego TP9) are aware of what we are doing as is Nort Fowler (AFRL Rome - Senior Technical Advisor to Ray Urtz) They were all present at TP9 Meeting last week. Ian Fuss (DSTO Chair TP9) is fully supportive of this initiative and Greg Chase and I will brief him following this meeting. Stephen Hood's presence is very helpful and I will take his comments on board in preparing the PA whilst he 'does the rounds' in Washington (09/28/2000, 1:05 PM, Tony Rathmell (UK))
[100] look at the two TTCP PAs that are most advanced (one in C3I Group and one in EWS Group) (09/28/2000, 1:24 PM, Stephen

- Each country's resources contribution should only appear only as one "will not exceed" amount; these amounts should be similar[101]
- Normal approach is to develop formal draft PA in US bureaucracy, then staff whatever emerges to other countries. Need to have a "champion" in each country to push PA through national staffing[102]
- US needs to decide which service international program office will be responsible (Navy IPO?)[103]

10.3 TTCP C3I

10.3.1 TP-9 Command and Control

- Objective/Role (see TP9 TOR in handouts)
  - The objectives could include the definition of scenario requirements and review of existing/under development scenarios.
- Planned/Proposed events[104]
- Proposed Workshop on Scenario (tentatively March 01@San Diego)[105]
- AG-3 Visualization[106,107]

10.4 ACTION ITEMS[108]

- Provide Suspense for editing, comments and final TTCP (12 Oct 00/31 Oct 00)
- Target date for allies to be up on CFBL (27 Oct 00)
- JWID Leads from each country (13 Oct 00) - Responsible for pulling together JWID Plan

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Hood (AUS)}

[101] Agree - I just need to be aware of national commitment at the Project Level to respond to comments that each nation is not contributing equally to individual Projects. {09/28/2000, 12:53 PM, Tony Rathmell (UK)}

[102] In the case of CINC21 I have agreed in TTCP C3I TP9 to staff the PA within the UK. I intend to 'flesh it out' following this weeks meeting. I will then circulate it to the CINC21 national leaders for review and comment. I will then submit it to International Research Collaboration (IRC) in London who will formally circulate it to the appropriate national IRC officers who then action 'in country' approval. {09/28/2000, 12:32 PM, Tony Rathmell (UK)}

[103] Yes - this is true for all nations as the customer focus is needed for the national IRC elements to drive the approval process. {09/28/2000, 12.55 PM, Tony Rathmell (UK)}

[104] We are looking for participation of some CINC 21 people to the workshop (as operational users or scientific staff). Stay tuned for an e-mail announcement {09/28/2000, 3:12 PM, Denis Gouin (CAN)}

[105] Whose workshop? CINC21 or TP9? {09/28/2000, 1.27 PM, Chris Gibson (UK)}

[106] We have not proposed any work on metrics for visualization. Is AGVis addressing this? {09/28/2000, 1 38 PM, Chris Gibson (UK)}

[107] AGVis will be looking at defining some evaluation metrics, but in Spring 2001 {09/28/2000, 3:40 PM, Denis Gouin (CAN)}

[108] There is much discussion in the various focus groups about other meetings (eg TTCP AGVis, a TP9 Scenario meeting). I think a project calendar would be really useful to keep date for our meetings and experiments etc, and associated meetings. Could this bed maintained on the web site? {09/28/2000, 1:33 PM, Chris Gibson (UK)}

- Meeting time for each Focus Area/Working Group (13 Oct 00)
- Add a Lessons Learned /After Action Report Folder to each Working Groups web page (13 Oct 00)
- Provide input to TP 8, 10 and other groups, agencies, organizations, etc.
- Provide Funding break out for each Focus Area/Working Group (28 Sep 00)
- Provide Dr. Guitouni with any products/presentation presented at the conference (28 Sep 00)
- Reserve Friday afternoon after the December JWID Conference for a Coalition hot wash (Review)
- Don Talada provide format for CFBL Project submissions (13 Oct 00)
- Objectives of Dec 00 Quarterly Conference (AUS) (13 Oct 00)
- Determine dates for US Quarterly Conference in Mar 01(Allies provide dates that are NOT good for the end of Mar 01 (5 Oct 00)
- Discuss the possibility of using a distributed Group Systems capability as a potential collaboration tool internal to the coalition team
- Scenario Strategy[109,110]

10.5 Group 6 Issues

10.5.1 Way Ahead

Clearly we are still at the stage of trying to get a handle on what the problems are. It would be useful at some stage to have a brainstorming session (either today or via email) where people can contribute their perceptions of the issues.

Another good starting point may be to contact the various national accrediting authorities that gave a temporary accreditation for JWID and get them to state what the blockers were in their agreeing to a permanent accreditation.

From an Australian perspective, we do not have a security agreement for the exchange of information between some NATO countries and us, meaning that for us to release any classified information to them would involve breaking the law.

In the absence of the necessary formal agreements, there are a variety of possible workarounds.

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[109] We have not resolved the scenario issues e.g which one and who will flesh it out. None of our focus groups are proposing to do this, though all note or imply the need for a scenario. (09/28/2000, 1:26 PM, Chris Gibson (UK))

[110] TP 9 has proposed a workshop on scenarios (see planned activities under TP9) (09/28/2000, 1:56 PM, Guy Vezina (CA))

One is to limit the info submitted to the CFBLNet to Unclassified only. The problem here is that it is likely to limit the richness of possible scenarios and/or create additional work in setting them up; although there are probably lots of problems to be solved before even getting to that stage.

For real classified data, one approach may be to set up a VPN accessible only by the US, UK, CA and AS.

The important thing is to have some mechanisms in place whereby all security-relevant issues can be identified and addressed.[111]

10.6 JWID schedule

- INITIAL PLANNING CONFERENCE- Virginia Beach, Virginia (USA), 11-15 Dec 00
- MID PLANNING CONFERENCE - Virginia Beach, Virginia (USA), 5-9 Feb 01
- FINAL PLANNING CONFERENCE - Virginia Beach, Virginia (USA), 7-11 May 01
- SCENARIO/ASSESSMENT/VISITORS, - 7-11 July 01
- JWID runs through the last week in July, not 11 Jul {09/28/2000, 3:25 PM, US}

10.7 Security/Biometrics

Points of contacts that are working on products similar to electronic visas & fingerprint recognition:

- US CMHP - Major Bob Logsdon - logsdon@jfcom.mil, 757-836-0461 & Paul Adams, adamspd@spawar.navy.mil, 619-553-3422.
- US MDDS - Mike Shimamoto, 808-477-7521
- CAN - POC @ DREV, robert.charpentier@drev.dnd.ca, martin.salois@drev.dnd.ca

10.8 Dr Tony Rathmell remarks

- Delighted with the work done. We went through a coalition exercise. Thanks to Ann Burns for her help.
- Has obtained the information he needs (except for the national $ commitments) for the PA.

[111] In the meantime, I will also raise some of these issues at the TP-11 meeting in Ottawa 2-6 Oct. {09/28/2000, 1:13 PM, Peter Drewer (AUS)}

- Please provide comments on the draft PA
- Request for a link from TTCP web site (TP9) to CINC 21 Coalition Public Page

10.9 LCol Barbour closing remarks

- Need everyone to continue to progress the work
- Need Group Leaders to be aggressive in moving on the work
- Prior to the AUS Workshop, we should better know our milestones / schedule / dependencies. For the JWID meeting we will need to have a good plan and the interrelationships between groups, have an idea of the scenario required. We should have thoughts on how to capture metrics (e.g. time) and tools to put on the network. All this will have to be finalize at the AUS workshop.
- We should all use the CINC 21 Coalition calendar on the Web site
- Need Allies to be proactive for project submission at the JWID conference (National Leaders). JWID Initial Planning conference is 11-15 December 2000.
- Possible demo to the J Staff at the Pentagon in December. Need to have a place for people to look for information. Use the CINC 21 Coalition Web Site.
- Consider using Group Systems (or similar tool) over the Internet
- Need to work on Scenario requirements (in addition to TP9 members). There is a scenario forum on the Web Site. Add information on Scenario briefing provided by Adel (need authorization). TP9 organizing a workshop in March 2001 on Metrics / Scenarios.

10.10 Greg Chase remarks - AUS Workshop

- Dates (Wednesday 6 - Friday 8 December 2000)
- Security clearances must be processed soon (needs to go through the respective Embassies)
- Need for a Visa

10.11 Other closing remarks

- Ms. Ann Burns can provide the content of the working session for future use with Group Systems
- Official thanks to Ann Burns for helping facilitating this meeting

11. Brainstorming the dependencies, etc.

11.1 Project 0 - Management Issues

- This project should also incorporate the overall architecture issues.
- TTCP C3I TP9 will look to TP10 to assist in this
- This Project will also have to address Measures of Effectiveness to support the various Project experiments
- TTCP JSA TP1 may assist in defining these
- The baseline of Coalition Lessons Learned will be provided by TTCP C3I TP9
- Funding estimate / refinement
- A more detailed Management Plan may be required to complement the management arrangements identified in the TTCP PA
- Relationships with CFBL NET as a service provider will need to be identified on the overall time plan

11.2 Project 1 - Visualization Tools and Techniques

- Project 1 is dependent on Groups 3 and 4 for information sources
- Project 1 may be dependent on Project 5 to add meta data which enables the selection of appropriate visualisations
- Project 1 may be dependent on Project 2 for a command activity (planning) in which to make benefit assessments of visualisations

11.3 Project 2 - Distributed Collaborative Planning

- TTCP reports which address/identify coalition lessons learned, issues; desired by Oct 2000
- Interactions with military personnel every two months to validate and provide course correction guidance on concepts and capabilities
- CFBL infrastructure for collaboration services strongly desired by December 2000
- JWID infrastructure for collaboration services agreed to by February 2001

- Scenario for first year experiments and assessments; desired by Mar 2001
- Scenario for final assessment and evaluations; Sep 2001
- Internal project coordination once per month until plans formalized
- Collaboration with 1 and 3 to develop a collaborative portal for the planners to seamlessly interact with the data, information, services, and people
- Project 2 is dependent on Projects 3 and 5 for information sources
- Dependent on geospatial (4) to support visualization
- Dependent on visualization (1) for representation of planning data input, output
- Dependent on 3/5 to support ontology and data representation of the

    a. Planning data: logistics, resources (e.g., equipment, personnel, organizations, countries), capabilities, weather, environment, tasks, missions, planning guidance, doctrine, etc

    b. Participants: the organizations, personnel who develop or contribute to the development of the plans, or are controlled by the plan

    c. Services: what is available to do the planning; for example software services, tools, or even organizations

11.4 Project 3 - Knowledge Management

- Project 3 is dependent on Projects 1 and 2 to provide one route to end-user benefit assessment
- Project 3 is dependent on Project 5 to create the data definitions and provide the data translation capabilities essential for information sharing
- Project 3 is dependent on Project 4 to enable the development of an integrated information portal
- Project 3 is dependent on an activity which defines a coalition information security policy and provides advice on acceptable information security mechanisms

11.5 Project 4 - Geospatial Information System

- Project 4 in Experiment 1 is not directly dependant on any other project. We would like input from other WG's but can continue without.
- Dependent on CFBL connectivity

- Having a common Knowledge Management/Geospatial portal

11.6 Project 5 - Common Ontology

- Project 5 is not dependent on any other project, but it supports many others. However it should draw from the experience of the other projects to assist in the definition of an overall Ontology for Coalition C2

- Project 1 (XSL methods for visualizing Project 5 information)

11.7 Timeline

December 2000: CFBLnet up

12. Attendees

AU	CA
Mr. Greg Chase Mr. Peter Drewer Dr. Stephen Hood UK Maj Andrew Churchill Dr. Chris Gibson Mr. Peter Houghton Dr. Jitu Patel Dr. Tony Rathmell US LTC Riki Barbour Mr. Bob Beaton Maj Vinnie Cirelli Mr. Peter Firey Mr. Mike Laurine Mr. John Maher Mr. Don Talada Mr. Doug Wood	Cdr J. M. Barber Ms Micheline Bélanger Mr Jean Berger Dr. Anne-Claire Boury-Brisset Ms Ann Burns Mr. Robert Charpentier Maj Gilles Clairoux Mr. David Demers Mr. Roger Fortin Mr. Pierre Fournier Ms Marlène Gauvin Dr. Allan Gibb Sgt Benoît Godbout Mr Denis Gouin Dr. Adel Guitouni Dr. Justin Hollands Mr. René Larose Mr. Clément L'Heureux Mr. Michel Lizotte Mr. Paul Morin Dr. Luc Pigeon Mr. Valdur Pille Mr. Drew Shantz Mr. Jean-Claude St-Jacques Mr. Gaétan Thibault Dr. Guy Vézina Lt(N) Elizabeth Woodliffe

Annexe A: TTCP-PA (DRAFT)

THE TECHNICAL COOPERATION PROGRAM (TTCP)

PROJECT ARRANGEMENT NO. *(insert No.)*

between

THE SECRETARY OF STATE FOR DEFENCE OF THE UNITED KINGDOM
OF GREAT BRITAIN AND NORTHERN IRELAND

THE SECRETARY OF DEFENSE ON BEHALF OF
THE DEPARTMENT OF DEFENSE OF THE UNITED STATES OF AMERICA

THE MINISTER FOR DEFENCE
ON BEHALF OF
THE DEPARTMENT OF
DEFENCE OF AUSTRALIA

THE DEPARTMENT OF
NATIONAL DEFENCE OF
CANADA

concerning

CINC21 Coalition Experimental Programme

INTRODUCTION

This Project Arrangement (PA) is entered into pursuant to the Memorandum of Understanding (MOU) among the Minister for Defence on behalf of the Department of Defence of Australia, the Department of National Defence of Canada, the New Zealand Defence Force, the Secretary of State for Defence of the United Kingdom of Great Britain and Northern Ireland, and the Secretary of Defense on behalf of the Department of Defense of the United States of America concerning The Technical Cooperation Program (TTCP) of 24 October 1995 the provisions of which are hereby incorporated by reference.

SECTION I - DEFINITION OF TERMS AND ABBREVIATIONS

1.1 The following terms and abbreviations used in this Project Agreement are defined as follows:

DERA - Defence Evaluation Research Agency (UK)
DREV - Defence Research Establishment - Valcartier (CAN)
DSTO - Defence Science and Technology Organisation (AUS)
DISA – Defense Information Systems Agency (US)
AITS – JPO - Advanced Information Technology Services Joint Project Office (US)

SECTION II - OBJECTIVES

2.1. The objectives of the CINC21 Coalition Research Programme are:

2.1.1 To define and conduct a set of multinational coalition command and control related experiments to advance the state of knowledge and contribute to the interoperability of future coalition operations.

2.1.2 The experimental programme will be centered on six primary Projects as follows:

2.1.2.1 Project 1 - Visualization tools and techniques

2.1.2.2 Project 2 - Development of coherent, commonly understood coalition operational plans using national planning aids and techniques.

2.1.2.3 Project 3 - Knowledge management and information management to support shared perception across a coalition force.

2.1.2.4 Project 4 - Open access to geospatial information across the coalition.

2.1.2.5 Project 5 - Common Ontology [for coalition C2 operations)

2.1.2.6 Project 6 - Information Assurance [in disparate coalition networks]

SECTION III - SCOPE OF WORK

3.1. The following work will be carried out under this TTCP PA.

3.1.1 The conduct of collaborative experiments (CE) related to coalition operations in the six Project areas at paragraph 2 above. The CE shall be flexible enough to allow the research to be conducted within a number of different scenarios consistent with the potential range of future multi-national coalition operations. Where practicable, a common scenario supporting a number

of operational vignettes will be used to ensure efficient exchange of information between CINC21 Programmes and to maximise the use of common simulation tools and experimental techniques.

3.1.2 The proposed programme of work for the initial two year period will comprise :

3.1.2.1 The development of the necessary infrastructure to support the planned experiments. This shall include configuring laboratory space at the various national research facilities, establishing and testing communication lines between the laboratories. The initial programme will comprise a set of unclassified experiments that may be conducted over a variety of public and/or private/defence networks.

SECTION IV - SHARING OF TASKS

4.1. The management and sharing of tasks will be as follows:

4.1.1 Each CINC21 Project shall have a nominated lead nation who is responsible for coordinating the collaborative research efforts of each contributing nation.

4.1.2 Each CINC21 Project nation shall appoint a Project point of contact (PPOC) who will be responsible for coordinating the national research efforts to be applied to the CINC21 Projects. The lead nation PPOC shall be responsible for coordinating the collaborative elements of the national research efforts for each CINC21 Project.

4.1.3 The allocation of Project Tasks between the lead nation and supporting nations shall be in accord with national capabilities and programmes.

4.1.4 Project Tasks shall be allocated in a manner consistent with achieving the aims of the respective CINC21 Projects in a timely and efficient manner.

SECTION V - PROJECT BREAKDOWN AND SCHEDULE

5.1. This TTCP Programme will consist of six projects comprising a work programme directed by the lead nation and respective national representatives and conducted against the project schedules at Annex XX (put the schedule in an annex so it can be easily amended).

5.1.1 These six projects are defined as follows.

- Project 1 - Visualisation tools and techniques - for coalition common operational picture (CCOP) representation.

  A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

  - Lead Nation - USA - PoC - Pete Wussow - SPAWAR
  - Supporting Nations - Canada - PoC - Denis Gouin - DREV
    Australia - PoC - Chris Ekins - DSTO
    Greg Chase - DSTO
    UK - PoC - Tracey Lynham

- Project 2 - Planning aids and techniques - for the development of coherent, commonly understood coalition operational plans.

A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

• Lead Nation -	USA -	PoC - Pete Fiery - Mitre Corp
• Supporting Nations -	Canada -	PoC – Dr Adel Guitouni - DREV
	Australia -	PoC - Richard Davis - DSTO
	UK -	PoC - (tbd)

- Project 3 - Knowledge and information management technologies - to support shared perception across a coalition force.

A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

• Lead Nation -	UK -	PoC - Liz Bilsby - DERA
• Supporting Nations -	Canada -	PoC - Marlene Gauvin - DREV
	Australia -	PoC - Mark Nelson - DSTO
	USA -	PoC - Bob Beaton - (tbd)

- Project 4 - Geospatial information technologies - for open access across the coalition.

A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

• Lead Nation -	Canada -	PoC - Denis Gouin – DREV
		PoC – Paul Morin – J2 Geo
• Supporting Nations -	USA -	PoC – Don Talada – NIMA
	Australia -	PoC - Chris Ekins - DSTO
	UK -	PoC - Liz Bilsby - DERA

- Project 5 - Development of a C2 Common Ontology - for coalition operations to assist in catagorizing and detecting omissions in the CINC21 coalition C2 research programme.

A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

• Lead Nation -	Australia -	PoC - Greg Chase – DSTO
• Supporting Nations -	Canada -	PoC – Anne-Claire Boury-Brisset - DREV
	USA -	PoC - Bob Beaton - (tbd)
	UK -	PoC - Mike Farrington DERA

- Project 6 - Information Assurance - in disparate coalition networks.

A more detailed description of the Project and its associated schedule is to be developed during the meetings in DREV 26 -28 Sept. 2000.

• Lead Nation -	Australia -	PoC - Peter Drewer - DSTO
• Supporting Nations -	Canada -	PoC - Karim Dahel - DREO
	USA -	PoC - Chris O'Donnel - Mitre Corp
	UK -	PoC - TBD

SECTION VI - MANAGEMENT

6.1 The management of the CINC21 Programme shall be effected by the following mechanisms:

6.1.1 The lead nation for the CINC21 Programme shall be the USA who will nominate a Programme manager (CINC21 PM) to lead the programme.

6.1.2 Each collaborating nation shall nominate a National Lead (CINC21 NL) to agree commitments and manage the allocation of national resources to the respective CINC21 Projects.

6.1.3 The CINC21 PM shall chair meetings of the CINC21 Steering Committee who shall meet at least once per year to direct the overall programme. The CINC21 NLs (or their delegated representatives) shall have a seat at the CINC21 Steering Committee. In the case of the USA, the CINC21 PM may also exercise the CINC21 NL responsibilities.

6.1.4 Additional Steering Committee meetings may be convened by the CINC PM or by majority request of the CINC21 NLs.

6.1.5 CINC21 Project Meetings shall be convened as required and be chaired by the lead nation PPOC.

6.1.6 All meetings shall have a formal Agenda, be minuted and conducted efficiently. Wherever possible VTC facilities and other electronic means of communication should be used to minimize the impact of travel.

6.1.7 A Web Site shall be developed for ensuring the efficient dissemination of knowledge about the CINC21 programme. The exchange of Project information shall be facilitated by suitably secure and password protected means. Management responsibility for this Web site shall be vested in the CINC21 AITS - JPO. Access to this Web site shall be permitted for all bona fide participants in the CINC21 Programme.

6.1.8 Annual reports shall be prepared summarizing the achievements, omissions and risks (AOR) associated with the overall CINC21 Programme and its constituent Projects. These reports shall be available to all TTCP Nations and presented at the Annual meetings of TTCP - C3I Group Technical Panels #9 (for C2 Systems Applications) and #10 (for Distributed Information Systems Technology)

6.1.9 The results of all CINC21 Project experiments and reports shall be available to all TTCP nations via an agreed distribution mechanism.

SECTION VII - RESOURCE ESTIMATES

7.1 The Participants in this TTCP PA estimate that the performance of the tasks under this TTCP PA will not exceed the resource estimates specified below:

7.1.1 The U.S. DOD resources expended in the performance of its PA tasks will not exceed (tba) unless formally agreed as an amendment to this PA.

7.1.2 The U.K. MOD resources expended in the performance of its PA tasks will not exceed (tba) unless formally agreed as an amendment to this PA.

7.1.3 The Department of Defence of Australia resources expended in the performance of its PA tasks will not exceed (tba) unless formally agreed as an amendment to this PA.

7.1.4 The Department of National Defence of Canada resources expended in the performance of its PA tasks will not exceed (tba) unless formally agreed as an amendment to this PA.

SECTION VIII - CLASSIFICATION

8.1. The highest level of Classified Information exchanged under this PA is SECRET.

(NOTE: The PO's must prepare a project security instruction and classification guide within three (3) months of PA signature in accordance with TTCP MOU Section XI)

SECTION IX - PRINCIPAL ORGANIZATIONS INVOLVED

9.1 The principal organisations participating in this Project Arrangement are:

UK Defence Evaluation Research Agency - Knowledge Information Systems Department - Malvern Worcs.
US Air Force Research Laboratories - Rome NY.
Canadian Defence Research Establishment - Valcartier Quebec
Australian Defence Science and Technology Organisation - Salisbury SA

SECTION X - EQUIPMENT AND MATERIAL TRANSFERS

10.1 S&T Harmonization and Alignment:

10.1.1 Equipment and Material transfers in support of S&T harmonization and alignment efforts will be documented using the TTCP Equipment and Material Transfer (E&MT) Form at Appendix 1. Selected National Technical Representatives of other designated national representatives will be authorized to sign TTCP E&MT Forms in accordance with applicable national procedures. TTCP E&MT Forms will be signed by the Participants involved in such Equipment and Material transfers prior to actual transfer of Equipment and Material. The provisions of Paragraph 10.3 will apply to all such Equipment and Material transfers under TTCP E&MT Forms.

10.2 TTCP Projects:

10.2.1 Provisions associated with Equipment and Material transfers in support of a specific TTCP Project will be contained in the applicable TTCP PA. A TTCP PA will be signed by the Contributing Participants prior to actual transfer of Equipment and Material associated with that TTCP Project. The provisions of paragraph 10.3 will apply to all such Equipment and Material transfers under TTCP PAs.

10.3 The following provisions apply to all Equipment and Material transfers under this MOU.

10.3.1 Each participant will transfer without charge to the other Participants such Equipment and Material identified in a TTCP E&MT Form or TTCP PA as being necessary for the corresponding TTCP Activity.

10.3.2 Equipment and Material transferred under TTCP E&MT Forms or TTCP PAs will be used by the receiving Participant only for the purposes detailed in this MOU and applicable TTCP E&MT Form or TTCP PA. In addition, the receiving Participant will maintain the Equipment and Material in good order, repair, and operable condition and return the items in operable condition and in as good a condition as received, normal wear and tear excepted. Unless the providing Participant has consented that the transferred Equipment and Material may be modified, expended, or otherwise consumed in connection with the TTCP Activity. Unless mutually decided otherwise, in the event of damage or loss, the receiving Participant will pay the cost of damage to (other than normal wear and tear) or loss of Equipment and Material under arrangements jointly decided by the providing and receiving Participants.

10.3.3 Each TTCP E&MT Form or TTCP PA will list the Equipment and Material to be transferred, and will provide detailed provisions for such transfers. For TTCP PAs, if a complete list of Equipment and Material to be transferred under the Project cannot be developed prior to TTCP PA signature, the TTCP PA may contain provisions for the development and maintenance of such a list by the POs.

10.3.4 Equipment and Material transferred under a TTCP E&MT Form or TTCP PA will remain the property of the owner and will be returned as set forth in the TTCP E&MT Form of TTCP PA. However, it is recognized that the success of a TTCP Activity may require the expenditure for consumption of the Equipment and Material. In such cases, the TTCP E&MT Form or TTCP PA will state that the Equipment and Material is to be expended or consumed and not returned to the providing Participant.

10.3.5 Except for claims relating to damage to or loss of Equipment and Material, the Contributing Participants in a TTCP Activity involving transfer of Equipment and Material under a TTCP E&MT Form or TTCP PA will not assert claims against each other for injury or death of its personnel, and damage to its property, resulting from the use of the Equipment and Material transferred by another Participant.

10.3.6 The Contributing Participants in a TTCP Activity involving transfer of Equipment and Material under a TTCP E&MT Form or TTCP PA will make every effort to ensure that the Equipment and Materials are furnished in a serviceable and usable condition according to its intended purpose. However, the Contributing Participants make no warranty or guarantee of fitness of the Equipment and Material for the particular purpose or use, and make no commitment to modify, improve, or adapt the Equipment and Material or any part thereof.

10.4 In accord with the provision at 10.3.3, the PO's identified in this PA shall maintain a list of equipment and materials for transfer as and when such equipment and materials are identified and become available. Each such transfer will be the subject of a TTCP E&MT Form.

SECTION XI - AMENDMENT, TERMINATION, WITHDRAWAL ENTRY INTO EFFECT, AND DURATION

11.1 Amendment, termination, or withdrawal from this TTCP PA will be in accordance with Section XVI (Amendment, Termination, Withdrawal, Entry into Effect, and Duration) of the TTCP MOU.

10.1 This TTCP PA will enter into effect upon the date of the last signature below and will remain in effect for 2 years.

Signature	Signature
Name	Name
Title	Title
Date	Date
Location	Location
Signature	Signature
Name	Name
Title	Title
Date	Date
Location	Location

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- Groupe 1: outils et techniques de visualisation
- Groupe 2: planification collaborative distribuée
- Groupe 3: gestion des connaissances
- Groupe 4: systèmes d'information géospatiale
- Groupe 5: ontologie commune
- Groupe 6: assurance de l'information

Cet atelier a permis aux différents groupes de raffiner leurs plans d'action pour contribuer à l'arrangement de projet TTCP PA Ces plans d'action sont rapportés dans le cadre de ce document.

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